

SILVER

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In 2003, silver production in the United States, which accounted for about 7% of global mine production, declined by about 8% or 110 metric tons (t) compared with that of 2002. Silver was produced from precious-metal ores at about 24 lode mines and from base-metal ores at about 13 mines. Fewer than 10 placer operations recovered silver in 2003, and the quantity recovered was less than 1% of total domestic production. Alaska's silver production was withheld to protect company proprietary data, but Alaska remained the country's leading silver producer in 2003.

Photography remained the leading domestic market for silver products in 2003, accounting for an estimated 1,900 t or about 35% of total domestic consumption, down from 37% in 2002.

U.S. imports for consumption of refined silver totaled 4,510 t, 210 t more than in 2002 (table 1). Mexico (47%) was the leading source of imported refined silver into the United States, followed by Canada (30%) and Peru (13%). The silver content of all imports totaled about 5,000 t.

In 2003, silver was mined in more than 40 countries. Mine production in 2003 was essentially unchanged from mine production in 2002. Increased mine production in China, Chile, Peru, and Russia was slightly more than offset by reduced mine output in Australia, Canada, Mexico, and the United States. In Russia, the startup of the Dukat silver mine in the fourth quarter of 2002 helped boost Russia's mine output of silver in 2003 by about 75% to 700 t. In World Silver Survey 2004, the Silver Institute listed Mexico as the world's leading silver producer followed by Peru, Australia, China, and Poland (Silver Institute, 2004, p. 19).

Legislation and Government Programs

The U.S. Mint is responsible for safeguarding a significant portion of the Nation's precious-metal resources and is the custodian of most of its silver. The value of the resources is reported at the lower of cost or market value. Amounts and values of custodial silver in the custody of the U.S. Mint on September 30, 2003, were 220,062 kilograms of silver with a market value of \$36.190 million (at \$5.1150 per fine troy ounce) and a statutory value of \$9.148 million. A statutory rate of \$1.29292 per fine troy ounce was used to value the custodial silver held by the U.S. Mint. During the first year following depletion of silver in the National Defense Stockpile, the U.S. Mint used about 280 t of silver in its bullion coinage and commemoratives. Previously while using the stockpile transfers, large taxpayer savings were generated since silver was carried on the books at \$1.29 per ounce. The sale price of the coins was at the current market price for silver plus a \$1.25 cost allocated for minting each coin (U.S. Mint, undated¹).

Production

Production data were obtained from about 47 domestic producers, most of which responded to requests from the U.S. Geological Survey for data, representing about 92% of U.S. production.

Domestic mine production of silver, which totaled 1,240 t, was down sharply in 2003 compared with production in 2002 (table 1). The 8% decline was the third consecutive drop in mine output and reduced mine production to its lowest level since 1994. Most of the drop in output can be attributed to the closure of Echo Bay Mines Ltd.'s McCoy/Cove gold mine in Nevada. Production at the mine, which had been a major producer in previous years, was discontinued on March 31, 2002, and the mine site has been reclaimed. Despite the rebound in global copper prices during 2003, there was a significant reduction in byproduct silver generated at copper mines. Downtime at Kennecott Utah Copper Corp.'s Bingham Canyon Mine reduced production from late March until mid-April 2003. Also contributing to lower production were lower grades of ore being dug from the mine. While copper ore grades were lower by about 8% compared with 2002 ore grades, silver ore grades were down by 31%. Reductions at Bingham Canyon were compounded by cutbacks at Asarco, Inc.'s Mission Mine in southern Arizona. Asarco (a subsidiary of Grupo Mexico S.A. de C.V.) announced on December 20, 2002, that it had significantly reduced copper production at its Mission mining complex to about 15% of its established capacity (Asarco, Inc., 2002; Silver Institute, 2004, p. 21-22).

Consumption

Silver, the least expensive of the precious metals, is the whitest and has the highest electrical and thermal conductivity of all the metals. These and other unique properties are the basis for its use in catalysts, electrical and electronics components, jewelry and silverware, and photography.

¹References that include a section mark (§) are found in the Internet References Cited section.

The annual decline in demand for silver by the photographic sector accelerated in 2003, falling by 8.5% to 1,920 t compared with 2,100 t in 2002. Global use of silver in the photographic industry totaled 6,100 t in 2003, a decrease of 5% when compared with use in 2002. The decline in market share for photography was the continuation of a decline in silver use in this sector that began in 2000. Competition from digital technology has been the main factor contributing to this reduction in silver use. Analysts at the Photo Marketing Association estimated that overall U.S. camera sales were expected to rise to 25 million units in 2003 from 24 million units in 2002—a modest increase—but sales of digital cameras were expected to soar to nearly 13 million units in 2003 from 9.4 million units in 2002 and were forecast to reach 22.8 million units in 2004. Part of the reason for digital photography's increasing popularity is that better technology has addressed several user complaints, such as slow image processing, poor battery life, and photo quality differences between film and digital cameras. The declining cost of digital imaging technology is another factor that has contributed to the weakening demand for silver-base photography (Photo Marketing Association International, 2004). Domestic uses of silver in industrial applications other than photography increased by about 3%, driven by increased demand in the electrical and electronics sectors and an improving economic environment.

As the white precious metal, silver still had significant use as an historic storage of wealth in coinage, jewelry, and silverware. U.S. silver fabrication (486 t) in this sector increased by about 11%. Because silver does not spark when subjected to an electrical charge, it is used in electronics as a solder and in electrical contacts. The most significant uses of silver in electronics are in the preparation of thick-film, silver-palladium pastes for use as silkscreen circuit paths in multilayer ceramic capacitors, in the manufacture of membrane switches, silver film in electrically heated automobile windshields, and in conductive adhesives. Domestic fabrication demand in this sector was about 1,230 t in 2003, an increase of about 5% when compared with 1,170 t used in 2002. Other uses consumed about 1,470 t of silver as antibacterial agents, in bearings, chemical catalysts used to make basic feedstock for polyethylene, dental alloys, mirrors, solders, and other applications. Another 341 t of silver was used in the making of silver bullion coins, which were purchased by investors (Silver Institute, 2004, p. 76-83).

Prices

For much of 2003 the price of silver ranged between \$4.50 and \$5.00 per troy ounce, with an annual average price of \$4.91 per ounce that was only 6% above the 2002 average. This average increase was much less than the 17% increase for gold and the 28% increase experienced by platinum.

Trade

Domestic silver supply was estimated to be 6,570 t in 2003. The largest component of the silver supply was made up of imported silver bullion, dore, silver metal, and other silver-bearing materials with a total silver content of about 5,000 t. Exports of refined silver totaled 181 t in 2003. The silver content of all exports, including waste and scrap, was about 1,300 t.

World Review

In 2003, global silver output decreased by about 100 t to 18,700 t. Most of the decrease in output was attributed to reported moderate decreases in silver production for Australia, Canada, Mexico, and the United States, which fell by a combined 592 t.

Chile.—Silver production in Chile increased by 3% to 1,250 t. Higher primary silver output along with increased byproduct silver produced at the country's copper mines accounted for the bulk of the increase. Coeur d'Alene Mines Corporation's Cerro Bayo Mine accounted for a large portion of primary silver production, increasing to 151 t in 2003 from 97 t in 2002. Adding to the total was a 59% increase in silver output from the Escondida copper mine, which temporarily reduced production in 2002 owing to weak market conditions (Coeur d'Alene Mines Corporation, 2004; Silver Institute, 2004, p. 23). The Cerro Bayo property covers about 103 square miles and is located south of Coyhaique, the capital of Region XI in southern Chile. The Cerro Bayo property is known to include multiple epithermal veins containing gold and silver. Coeur has been granted exploitation concessions (the Chilean equivalent of an unpatented claim except that the owner does not have title to the surface, which must be separately acquired from the surface owner) covering the mineralized areas of the property as well as necessary surface rights to permit mining.

The ore processing mill at the Cerro Bayo Mine uses the standard flotation process to produce a high-grade gold-and-silver concentrate. The concentrate processed at this mill is sold to third-party smelters, primarily in Japan. During 2003, Coeur began metallurgical studies designed to determine the feasibility of further treating the concentrate to produce a dore, which would reduce transportation and refining costs. The mill has a design capacity of 1,500 metric tons per day. During 2003, recovery rates of 90% for gold and 92% for silver were achieved.

China.—Mine production of silver in China grew at the rate of about 10% per year during the past 10 years, reaching an alltime high in 2003. While domestic demand for silver was strong in 2003, reaching 1,980 t, it grew at a slower rate than production. To ease the oversupply pressure on its domestic market, China exported large quantities of silver to the international market. Some silver specialists in China believe that a better solution for solving the supply imbalance would be to expand domestic consumption. This would require the country to attach greater importance to developing downstream products of silver, a prerequisite to developing domestic demand and seizing market share. In China, silver is mainly used in the chemical industry, electrical and electronics products, and jewelry. The technology for processing silver beyond the refinery stage, however, is not yet fully developed (Antaike Precious & Minor Metals Monthly, 2003).

A major portion of silver production in China is from imported base-metal concentrates. In an effort to gain more control of the silver management mechanism, the central Government reinstated the value added tax (VAT) on imports of silver. According to a Financial Ministry circular, the VAT was resumed on imports of silver contained in concentrates, nonferrous metals, smelting semis, and silver contained in silver products. The Chinese Government repealed the VAT on these products in 2000 in an effort to support the development of the domestic silver market in China (Antaiko Precious & Minor Metals Monthly, 2003; Silver Institute, 2004, p. 75).

Mexico.—Silver output was down by 6% from 2,747 t in 2002 to 2,569 t in 2003. Increased output from Hecla Mining Company's San Sebastian Unit and some of Mexico's small- to medium-sized silver producers was more than offset by an 8% decrease in output by Industrias Peñoles, S.A. de C.V., the country's leading silver producer. Peñoles reported the production of 1,500 t of silver in 2003 compared with 1,640 t in 2002. Several units in Peñoles' mining division reported production records. Total metal content production, however, declined owing to the closure of the Las Torres (Guanajuato) and El Monte (Hidalgo) mines that had reached the end of their operational life cycles. The combined loss of production from these operations totaled about 80 t of silver (Hecla Mining Company, 2004, p. 35; Industrias Peñoles, SA. de C.V., undated§).

Peru.—Peru was South America's leading producer of silver. Cia. Minas Benaventura (367 t) and Volcan Cia. Minera (295 t) were Peru's leading silver producers in 2003. Peru produced 2,775 t of silver in 2003, a 3% increase compared with 2002 production. Essentially all of Peru's silver production was as a byproduct of lead and zinc mining (Silver Institute, 2004, p. 19).

Current Research and Technology

Antibiotic-resistant bacteria are a major concern to healthcare providers in the United States and around the world. Now, a new line of bandages with a natural silver-base antibacterial agent to which bacteria reportedly cannot become resistant has been introduced. Silver has a long history of antibacterial uses. In the Middle Ages, wealthy families thought that silver metal had disease-fighting properties, so they fed their children with silver spoons. The ancient Greeks drank wine from silver cups because they thought it would minimize the outbreak of disease. Silver dressings are used regularly in hospital settings to help control infections in major wounds and burns. The new silver-base bandages use silver in the wound pad as a natural antibacterial agent. Laboratory tests reportedly showed that silver reduced bacterial growth such as *Staph. aureus*, *E. coli*, *E. hirae*, and *Pseudomonas aeruginosa* (a powerful germ that does not respond to many antibacterials) in the dressing for 24 hours (Beiersdorf Inc., 2004).

Outlook

In 2003, about 35% of domestic silver use was in photography, down from 37% in 2002. Silver use in photography fell for the second consecutive year. Although the decline has been partially owing to economic weakness and the reduction in tourism travel in the United States, digital photography continues to eat into silver's share of the photographic market. In 2002, global sales of digital cameras increased by 20%, compared with a modest decrease in sales of conventional cameras. Conventional camera sales increased modestly in 2003, while sales of digital cameras increased by 31%. In the medium term, it appears that the impact of digital technology will continue to grow, affecting demand not only in photographic films, but also to some degree in graphic arts paper, medical x-ray film, and motion picture film. As new digital technology is introduced and the cost of digital cameras is subsequently reduced, this process can be expected to accelerate. The cost per pixel for digital cameras has fallen dramatically during the past decade, which translates into cheaper cameras with improved picture quality.

Demand for silver continues to outstrip supply each year, and the aboveground supply has been drawn down. Uses for silver continue to grow in the fields of electronics, medicine, superconductivity, water purification, and many others. The fear that digital photography may greatly decrease demand for silver, at least in the medium term, may be unfounded for two reasons. First, on January 13, 2004, the Eastman Kodak Company announced that it would "increase its commitment to high-performance APS films and 35 mm reloadable camera sales and manufacturing in emerging markets," such as China, Eastern Europe, India, and Latin America. China's consumption of silver has been growing rapidly and was estimated to have been about 1,980 t in 2003. China has become the world's third leading market for photographic materials, with film sales reaching 205 million rolls in 2003 and color paper sales of more than 97 million square meters during the same period. The other reason is that most of the silver used in photography is recycled, making the overall impact of the photography segment on silver demand less than it appears (Antaiko Precious & Minor Metals Monthly, 2004; Eastman Kodak Company, 2004).

Fuel cells offer a long-term option for power generation and motor vehicles. Currently, fuel cell development for use in motor vehicles is centered on proton exchange membrane (PEM) cells and alkaline-base cells. While the most promising research is focused on platinum-base fuel cells, alkaline-base cells are also of interest because they have cost and technical advantages compared with PEM cells, including the ability to use nonplatinum catalysts, such as gold or silver. The U.S. Government recently proposed a federally funded 3-year study on the use of gold and silver as catalysts for automotive and industrial uses.

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GENERAL SOURCES OF INFORMATION

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TABLE 1
SALIENT SILVER STATISTICS¹

		1999	2000	2001	2002	2003
United States:						
Mine production:						
Quantity	metric tons	1,950	1,980	1,740	1,350 ^r	1,240
Value	thousands	\$329,000	\$318,000	\$245,000	\$201,000 ^r	\$196,000
Refinery production:						
Domestic and foreign ores and concentrates	metric tons	2,000	2,780	2,640	2,580	2,160
Scrap (old and new)	do.	1,500	1,680	1,060	1,030	1,200
Exports, refined	do.	621 ^r	373 ^r	783 ^r	680 ^r	181
Imports for consumption, refined	do.	3,190 ^r	4,090 ^r	3,340 ^r	4,300 ^r	4,510
Stocks, December 31:						
Industry	metric tons	NA	462	360	280	93
Futures exchanges	do.	2,490	2,920	3,250	3,290	3,430
Department of the Treasury	do.	617	220	220	220	220
National Defense Stockpile	do.	778	458	21	--	--
Price, average ²	dollars per troy ounce	\$5.25	\$5.00	\$4.39	\$4.62	\$4.91
Employment, mine and mill workers ³		1,500	1,200	1,100	1,100	1,200
World, mine production	metric tons	17,100 ^r	17,800 ^r	18,500 ^r	18,800 ^r	18,700 ^e

^eEstimated. ^rRevised. NA Not available. -- Zero.

¹Data are rounded to no more than three significant digits, except prices.

²Price data are the annual Handy & Harman quotations published in Platts Metals Week.

³Employment data are from the Mine Safety and Health Administration.

TABLE 2
MINE PRODUCTION OF SILVER IN THE UNITED STATES, BY STATE¹

(Kilograms)

State	2001	2002	2003
California	7,590	3,440 ^r	958
Colorado	2,830	W	W
Nevada	544,000	424,000	322,000
Other ²	1,180,000	927,000 ^r	916,000
Total	1,740,000	1,350,000 ^r	1,240,000

^rRevised. W Withheld to avoid disclosing company proprietary data, included with "Other."

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes Alaska, Arizona, Colorado (2002-03), Idaho, Missouri, Montana, New Mexico, South Dakota, and Utah.

TABLE 3
LEADING SILVER-PRODUCING MINES IN THE UNITED STATES IN 2003, IN ORDER OF OUTPUT¹

Rank	Mine	County and State	Operator	Source of silver
1	Greens Creek	Juneau, AK	Kennecott Greens Creek Mining Co.	Zinc ore.
2	Red Dog	Northwest Arctic, AK	Teck Cominco Alaska Inc.	Lead-zinc ore.
3	Rochester	Pershing, NV	Coeur d'Alene Mines Corp.	Gold ore.
4	Galena	Shoshone, ID	Silver Valley Resources Corp.	Silver ore.
5	Bingham Canyon	Salt Lake, UT	Kennecott Utah Copper Corp.	Copper-molybdenum ore.
6	Midas ²	Elko, NV	Newmont Gold Company	Silver ore.
7	Lucky Friday	Shoshone, ID	Hecla Mining Company	Do.
8	Montana Tunnels	Jefferson, MT	Montana Tunnels Mining, Inc.	Gold ore.
9	Carlin Mines Complex	Elko, Eureka, NV	Newmont Gold Company	Do.
10	Bagdad	Yavapai, AZ	Phelps Dodge Corp.	Copper-molybdenum ore.
11	Round Mountain	Nye, NV	Round Mountain Gold Corporation	Gold ore.
12	Denton-Rawhide	Mineral, NV	Kennecott Rawhide Mining Co.	Do.
13	Mission Complex ³	Pima, AZ	ASARCO Incorporated	Copper ore.
14	Brushy Creek	Reynolds, MO	Doe Run Resources Corp.	Lead ore.
15	Fletcher	do.	do.	Do.
16	Ray	Pinal, AZ	ASARCO Incorporated	Copper ore.
17	Buick	Iron, MO	Doe Run Resources Corp.	Lead ore.
18	Cresson	Teller, CO	Cripple Creek & Victor Gold Mining Co.	Gold ore.
19	Betze-Post/Goldstrike	Eureka, NV	Barrick Gold Corporation	Do.
20	Meikle/Goldstrike	Elko, NV	do.	Do.
21	Continental Pit	Silver Bow, MT	Montana Resources, Inc.	Copper-molybdenum ore.
22	Sweetwater	Reynolds, MO	Doe Run Resources Corp.	Lead ore.
23	Florida Canyon	Pershing, NV	Florida Canyon Mining, Inc.	Gold ore.
24	Viburnum #28	Iron, MO	Doe Run Resources Corp.	Lead ore.
25	Fort Knox	Fairbanks, AK	Fairbanks Gold Mining, Incorporated	Gold ore.

¹The mines on this list accounted for 99% of U.S. mine production in 2003.

²Formerly Ken Snyder.

³Includes Eisenhower, Mission, Pima, and San Xavier Mines.

TABLE 4
U.S. EXPORTS OF SILVER, BY COUNTRY¹

Year and country	Silver ores and concentrates		Bullion		Doré		Total	
	Silver content (kilograms)	Value (thousands)	Silver content (kilograms)	Value (thousands)	Silver content (kilograms)	Value (thousands)	Silver content (kilograms)	Value (thousands)
2002	230,000	\$56,600	624,000	\$97,900	22,700	\$3,360	877,000	\$158,000
2003:								
Armenia	43	9	18	4	--	--	61	13
British Virgin Islands	--	--	82	15	--	--	82	15
Canada	--	--	16,200	2,750	94	13	16,300	2,770
El Salvador	4	4	--	--	--	--	4	4
France	--	--	94	17	--	--	94	17
Guatemala	--	--	811	144	--	--	811	144
Hong Kong	16	11	85	15	--	--	101	26
Japan	392	172	128	25	--	--	520	197
Korea, Republic of	--	--	432	78	80	20	512	98
Mexico	57,100	15,900	20,900	3,230	--	--	78,000	19,100
Netherlands	--	--	71	14	--	--	71	14
Singapore	--	--	53	8	--	--	53	8
Sri Lanka	--	--	66	11	--	--	66	11
Switzerland	--	--	--	--	19,600	3,160	19,600	3,160
Taiwan	--	--	12	3	--	--	12	3
Trinidad and Tobago	212	47	22	4	--	--	234	51
United Kingdom	123	22	95,900	14,400	--	--	96,000	14,400
Total	57,900	16,200	135,000	20,700	19,800	3,190	212,000	40,100

-- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 5
U.S. EXPORTS OF SILVER, BY COUNTRY¹

Year and country	Other unwrought silver		Metal powder		Silver nitrate		Semimanufactured forms ²		Waste and scrap	
	Gross weight (kilograms)	Value (thousands)	Gross weight (kilograms)	Value (thousands)	Gross weight (kilograms)	Value (thousands)	Gross weight (kilograms)	Value (thousands)	Gross weight (kilograms)	Value (thousands)
2002	32,700	\$9,960	360,000	\$63,600	81,200	\$9,560	290,000	\$50,300	2,380,000	\$555,000
2003:										
Argentina	--	--	--	--	--	--	--	--	686	98
Australia	--	--	--	--	13,300	1,940	33	6	--	--
Austria	--	--	255	43	--	--	--	--	1,490	200
Belgium	77	16	1,510	266	--	--	3,220	543	159,000	35,100
Brazil	--	--	--	--	--	--	21,400	3,610	107	17
Canada	16,200	3,070	11,400	1,950	43,200	5,640	46,000	7,880	655,000	132,000
Cayman Islands	185	50	--	--	--	--	--	--	--	--
China	77	24	663	123	6,400	665	1,660	283	272,000	37,400
Colombia	--	--	--	--	--	--	83	14	8	23
Czech Republic	--	--	--	--	--	--	47	8	85	28
Dominican Republic	2,730	596	57	10	--	--	913	155	81	11
Finland	--	--	1,660	287	--	--	--	--	327	42
France	4	3	13,700	2,420	--	--	8,710	1,580	2,420	228
Germany	110	26	51,200	8,850	19	6	10,200	1,780	147,000	31,300
Grenada	--	--	--	--	--	--	260	45	--	--
Guadeloupe	--	--	--	--	--	--	--	--	137	18
Hong Kong	149	84	43,600	7,440	367	65	12,200	2,110	801	117
India	82	20	73	17	--	--	294	52	13,100	2,030
Israel	--	--	722	123	--	--	1,220	212	--	--
Italy	94	18	56,600	9,600	6	5	1,300	223	215,000	49,800
Jamaica	120	26	--	--	--	--	203	35	--	--
Japan	152	76	54,100	9,470	--	--	31,800	5,430	178,000	45,100
Jordan	--	--	--	--	--	--	1,070	189	--	--
Korea, Republic of	433	102	40,700	7,030	242	30	52,300	9,030	5,650	734
Lithuania	--	--	--	--	--	--	421	72	--	--
Lebanon	--	--	231	41	--	--	--	--	--	--
Malaysia	--	--	--	--	--	--	883	168	42	5
Mexico	3,440	854	11,000	1,970	3,740	586	64,000	11,300	2	4
Netherlands	--	--	5,630	970	--	--	6,640	1,150	--	--
Netherlands Antilles	171	38	--	--	--	--	--	--	--	--
New Zealand	21	4	27	5	--	--	161	35	--	--
Panama	213	55	--	--	--	--	87	15	--	--
Philippines	--	--	--	--	70	13	1,270	207	21	3
Poland	--	--	--	--	--	--	501	85	--	--
Russia	3	4	--	--	--	--	--	--	262	1,280
Saudi Arabia	--	--	--	--	50	9	44	8	107,000	24,900
Singapore	--	--	4,810	819	--	--	7,280	1,260	226	31
South Africa	--	--	--	--	26	3	--	--	13,800	1,950
Spain	28	6	--	--	--	--	18,200	3,090	--	--
Sweden	3	3	2,860	486	--	--	518	95	194,000	26,300
Switzerland	19	4	581	105	--	--	366	70	--	--
Taiwan	55	13	82,400	14,100	558	115	10,100	1,730	9,210	1,260
Thailand	527	86	210	36	--	--	14,700	2,380	--	--
Trinidad and Tobago	5	3	--	--	--	--	311	56	--	--
Turkey	--	--	--	--	--	--	--	--	761	99
United Arab Emirates	--	--	--	--	--	--	97	16	537	115
United Kingdom	273	111	89,200	15,300	--	--	17,600	3,110	41,200	19,800
Uruguay	--	--	--	--	--	--	7,860	1,330	198	26
Venezuela	116	25	--	--	999	34	--	--	120	16
Vietnam	431	94	--	--	--	--	--	--	--	--
Other	264	60	104	18	183	20	264	50	31	12
Total	26,000	5,470	473,000	81,500	69,200	9,120	344,000	59,400	2,020,000	410,000

-- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Containing 99.5% or more by weight of silver.

Source: U.S. Census Bureau.

TABLE 6
U.S. IMPORTS FOR CONSUMPTION OF SILVER, BY COUNTRY¹

Year and country	Silver ores and concentrates		Ash and residues		Bullion		Dore		Total	
	Silver content (kilograms)	Value (thousands)	Silver content (kilograms)	Value (thousands)	Silver content (kilograms)	Value (thousands)	Silver content (kilograms)	Value (thousands)	Silver content (kilograms)	Value (thousands)
2002	61,000	\$13,100	63,500	\$11,600	4,020,000	\$593,000	16,600	\$4,430	4,100,000	\$610,000
2003:										
Belgium	--	--	--	--	3,010	470	--	--	3,010	470
Canada	2,540	1,370	--	--	1,300,000	209,000	904	145	1,300,000	210,000
Chile	--	--	--	--	61,800	9,590	--	--	61,800	9,590
China	--	--	--	--	18,000	2,630	--	--	18,000	2,630
Colombia	--	--	--	--	--	--	1,690	302	1,690	302
Costa Rica	--	--	--	--	75	22	--	--	75	22
France	--	--	--	--	92	14	--	--	92	14
Germany	--	--	--	--	40,300	6,280	--	--	40,300	6,280
Hong Kong	--	--	--	--	17,000	2,690	--	--	17,000	2,690
Italy	--	--	--	--	19,400	3,180	117	28	19,500	3,200
Mexico	--	--	--	--	1,710,000	264,000	220,000	69,700	1,930,000	334,000
Panama	--	--	--	--	190	62	--	--	190	62
Peru	--	--	--	--	557,000	86,400	10,500	2,010	568,000	88,500
Poland	--	--	--	--	40,000	6,760	--	--	40,000	6,760
Sweden	--	--	--	--	1,560	245	--	--	1,560	245
Taiwan	--	--	1,340	266	--	--	--	--	1,340	266
United Kingdom	--	--	--	--	238,000	38,400	--	--	238,000	38,400
Total	2,540	1,370	1,340	266	4,000,000	630,000	233,000	72,200	4,240,000	703,000

-- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 7
U.S. IMPORTS FOR CONSUMPTION OF SILVER, BY COUNTRY¹

Year and country	Other unwrought silver		Metal powder		Silver nitrate		Semimanufactured forms ²		Waste and scrap	
	Gross weight (kilograms)	Value (thousands)	Gross weight (kilograms)	Value (thousands)	Gross weight (kilograms)	Value (thousands)	Gross weight (kilograms)	Value (thousands)	Gross weight (kilograms)	Value (thousands)
2002	263,000	\$38,700 [†]	12,100	\$2,540	572	\$103	70,800 [†]	\$10,400 [†]	816,000	\$117,000
2003:										
Argentina	--	--	--	--	--	--	--	--	8	107
Aruba	--	--	--	--	--	--	--	--	(3)	5
Australia	--	--	--	--	25	7	--	--	247	728
Belgium	--	--	12	2	--	--	--	--	7	33
Bermuda	--	--	--	--	--	--	--	--	1	3
Brazil	--	--	--	--	--	--	4,420	729	84	294
Canada	56,300	8,620	456	48	15	5	3,150	538	195,000	23,600
Chile	--	--	--	--	--	--	--	--	60	314
China	18,000	2,730	--	--	--	--	--	--	3,750	527
Colombia	--	--	--	--	--	--	--	--	1,220	181
Costa Rica	--	--	--	--	--	--	--	--	42,700	4,340
Dominican Republic	4	12	57	7	--	--	--	--	3,180	1,460
El Salvador	--	--	--	--	--	--	--	--	(3)	3
France	977	202	4,350	810	--	--	284	46	1,220	303
Germany	3	8	3,140	636	--	--	231	32	25,300	3,090
Guatemala	--	--	--	--	--	--	--	--	18	242
Hong Kong	--	--	(3)	7	--	--	--	--	6	26
India	570	184	--	--	--	--	432	65	54	9
Ireland	--	--	--	--	--	--	--	--	44	324
Israel	--	--	(3)	2	--	--	--	--	11,500	322
Italy	276	169	100	16	--	--	(3)	14	10,100	2,940
Jamaica	--	--	--	--	--	--	--	--	998	18
Japan	55	14	9,250	2,030	224	37	--	--	2,360	1,820
Jordan	--	--	--	--	--	--	--	--	1,570	325
Korea, Republic of	--	--	--	--	--	--	--	--	224	800
Kuwait	--	--	--	--	--	--	--	--	134,000	3,620
Malaysia	--	--	302	51	--	--	--	--	165,000	10,200
Mauritius	--	--	--	--	--	--	--	--	341	70
Mexico	205,000	30,300	345	41	362	36	3,740	571	40,200	21,200
Morocco	--	--	--	--	--	--	--	--	10,700	53
Netherlands	--	--	--	--	16	2	--	--	(3)	2
New Zealand	--	--	--	--	--	--	--	--	120	521
Panama	120	11	--	--	--	--	--	--	259	1,740
Peru	--	--	1,400	197	--	--	2,790	395	1	7
Philippines	--	--	--	--	--	--	--	--	99,000	4,040
Poland	--	--	--	--	--	--	320	28	--	--
Portugal	--	--	--	--	--	--	--	--	9,480	104
Saint Vincent and the Grenadines	--	--	--	--	--	--	--	--	7	3
Saudi Arabia	--	--	--	--	--	--	--	--	71,400	4,580
Singapore	--	--	--	--	--	--	--	--	3,370	1,130
South Africa	--	--	--	--	--	--	--	--	2	27
Spain	--	--	--	--	--	--	135	21	--	--
Switzerland	--	--	649	116	--	--	--	--	--	--
Taiwan	--	--	10	9	--	--	--	--	11,400	136
Thailand	--	--	--	--	--	--	--	--	2	26
United Kingdom	--	--	771	181	19	9	1,530	261	38,900	6,260
Venezuela	--	--	--	--	--	--	--	--	1,670	11,900
Total	281,000	42,200	20,800	4,160	661	96	17,000	2,700	886,000	107,000

[†]Revised. -- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Containing 99.5% or more by weight of silver.

³Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 8
SILVER: WORLD MINE PRODUCTION, BY COUNTRY^{1,2}

(Metric tons)

Country	1999	2000	2001	2002	2003 ^e
Algeria ^c	1	1	2 ³	2 ^r	2
Argentina	74	78	153	126	134 ³
Armenia	NA	NA	NA	6	4
Australia	1,720	2,060	2,100 ^e	2,077	1,872 ³
Bolivia	422	434	408	450 ^r	451
Brazil ⁴	42	41	46	33 ^r	35
Bulgaria ^c	25	54 ^r	57 ^r	60 ^r	60
Burma	4	2	2	2 ^e	2
Canada	1,174	1,212	1,265	1,408 ^r	1,309 ³
Chile	1,381 ^r	1,242 ^r	1,349	1,210 ^r	1,250
China ^e	1,320	1,600	1,910	2,200 ^r	2,500
Colombia	8	8	7	7	10 ³
Costa Rica ^c	-5	(5)	(5)	(5)	(5)
Dominican Republic	3 ^e	--	--	--	--
Ecuador ^c	2	2	2	2	2
El Salvador	(5)	--	--	--	--
Ethiopia	1	1	1	1 ^e	1
Fiji	2	1	--	--	--
Finland	32 ^e	25	24	30 ^e	34
France	1	1	1 ^e	1 ^e	1
Ghana	4 ^e	6 ^r	2	2 ^r	2
Greece	46	37	62	75	79 ³
Honduras	38	32	47	53	53
India	54 ^e	40	45 ^r	52	54
Indonesia	288	256	270 ^r	294 ^r	260
Iran ^c	21	22	22	23	23
Ireland	15	25	19	5 ^e	24
Italy ⁶	10	4	4	4 ^e	4
Jamaica	--	--	(5)	(5) ^e	(5)
Japan	94	104	80	81	79 ³
Kazakhstan	905	927	982	893 ^r	827
Korea, North ^c	40	40	40	40	40
Korea, Republic of ⁷	-- ^r	-- ^r	-- ^r	-- ^r	--
Macedonia ^c	22	20	15	10	10
Malaysia	4	(5)	(5)	--	-- ³
Mali ^c	1	1	2	3	3
Mexico	2,467	2,620	2,760	2,747 ^r	2,569 ³
Mongolia ^c	20	25	27	27	27
Morocco	278	289	281	277 ^r	201 ³
Namibia	10	9	20 ^r	44 ^r	45
New Zealand ^e	24 ³	23	23	32	32
Nicaragua	2	2	2	3 ^e	3
Oman	3	5	3	4 ^r	--
Panama ^c	2 ³	2	2	2	2
Papua New Guinea ^c	67 ³	73	73	75	74
Peru	2,231	2,145	2,353	2,687	2,775 ³
Philippines ^c	18 ³	17	17	9	9
Poland	1,100	1,148	1,194	1,229 ^r	1,200
Portugal	27	21	23 ^e	19 ^e	19
Romania ^c	50 ³	18 ^r	18 ^r	15 ^r	15
Russia ^c	375	370	380	400	700
Saudi Arabia	10	9	15	14 ^e	13
Serbia and Montenegro	8	9	6	7 ^r	2
Solomon Islands	2	(5) ^e	-- ^e	--	--

See footnotes at end of table.

TABLE 8--Continued
SILVER: WORLD MINE PRODUCTION, BY COUNTRY^{1,2}

(Metric tons)

Country	1999	2000	2001	2002	2003 ^e
South Africa	152	144	110	113	80 ³
Spain ^e	96	66 ³	60	50	50
Sudan	NA	NA	2	3	3
Sweden	284	329	306	299	306 ³
Tanzania	(5)	1	7	9 ^r	8
Tajikistan	5	5	5 ^e	50 ^e	50
Tunisia	4	4	4	3 ^e	3
Turkey ^e	100	110	100	100	100
United States	1,950	1,980	1,740	1,350 ^r	1,240 ³
Uzbekistan	89	90	80 ^e	80 ^e	80
Zambia ⁸	5	5 ^e	-- ^r	-- ^r	--
Zimbabwe	5	4	3	2	1 ³
Total	17,100 ^r	17,800 ^r	18,500 ^r	18,800 ^r	18,700

^eEstimated. ^rRevised. NA Not available. -- Zero.

¹World totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²Recoverable content of ores and concentrates produced unless otherwise specified. Table includes data available through August 13, 2004.

³Reported figure.

⁴Includes the following quantities, in kilograms, identified as secondary silver: 1999-2002--50,000 and 2003--50,000 (estimated).

⁵Less than 1/2 unit.

⁶Includes production from imported ores.

⁷Smelter and/or refinery production.

⁸Year beginning April 1 of that stated.